

CLAIMS

What is claimed is:

1. A hot-melt ink for use with an ink jet printing apparatus, the ink being a liquid at about 100°C to about 130°C and solidifying to a two-phase solid having an elastic phase and a crystalline phase, the ink comprising:

✓ PA ✓ a carrier; ✓
✓ a first plasticizer; ✓ aromatic ✓
a linear block copolymer; → SPS ✓
✓ a block copolymer plasticizer; → PVB ✓
✓ a flow additive; and ✓
✓ a colorant, ✓

wherein the block copolymer plasticizer, in combination with linear block copolymer forms an elastic phase of the ink upon solidifying, and wherein the first plasticizer exhibits sufficiently low viscosity at elevated temperatures to permit ejection of the liquid ink from the printing apparatus.

2. The hot-melt ink in accordance with claim 1 wherein the carrier is a fatty acid.

3. The hot-melt ink in accordance with claim 2 wherein the fatty acid is stearic acid.

4. The hot-melt ink in accordance with claim 1 wherein the first plasticizer is an aromatic hydrocarbon resin.

5. The hot-melt ink in accordance with claim 1 wherein the flow additive is a fluorinated polyolefin copolymer

6. The hot-melt ink in accordance with claim 1 wherein the block copolymer plasticizer is polyvinyl acetal.

7. The hot-melt ink in accordance with claim 6 wherein the polyvinyl acetal is polyvinyl butyral.

8. The hot-melt ink in accordance with claim 1 wherein the linear block copolymer is a tri-block copolymer.

9. The hot-melt ink in accordance with claim 8 wherein the tri-block copolymer is a styrene-butadiene-styrene block copolymer.

10. The hot-melt ink in accordance with claim 8 wherein the tri-block copolymer is a styrene-isoprene-styrene block copolymer.

11. The hot-melt ink in accordance with claim 1 wherein the colorant is Orient Oil black.

12. The hot-melt ink in accordance with claim 1 wherein the carrier is present in a concentration of about 45 percent to about 95 percent of the ink.

13. The hot-melt ink in accordance with claim 12 wherein the carrier is present in a concentration of about 78 percent of the ink.

14. The hot-melt ink in accordance with claim 1 wherein the first plasticizer is present in a concentration of about 0.1 percent to about 25 percent of the ink.

15. The hot-melt ink in accordance with claim 14 wherein the first plasticizer is present in a concentration of about 15 percent of the ink.

16. The hot-melt ink in accordance with claim 1 wherein the linear block copolymer is present in a concentration of about 0.5 percent to about 5.0 percent of the ink.

17. The hot-melt ink in accordance with claim 16 wherein the linear block copolymer is present in a concentration of about 1.0 percent of the ink.

18. The hot-melt ink in accordance with claim 1 wherein the flow additive is present in a concentration of about 0.5 percent to about 10 percent of the ink.

19. The hot-melt ink in accordance with claim 18 wherein the flow additive is present in a concentration of about 1.0 percent of the ink.

20. The hot-melt ink in accordance with claim 1 wherein the colorant is present in a concentration of about 2.0 percent to about 8.0 percent of the ink.

21. The hot-melt ink in accordance with claim 20 wherein the colorant is present in a concentration of about 4.0 percent of the ink.

22. The hot-melt ink in accordance with claim 1 wherein the block copolymer plasticizer is present in a concentration of about 0.5 percent to about 10 percent of the ink.

23. The hot-melt ink in accordance with claim 22 wherein the block copolymer plasticizer is present in a concentration of about 1.0 percent of the ink.

24. The hot-melt ink in accordance with claim 1 wherein the flow additive and the first plasticizer are polyester and polyamide.

25. A hot-melt ink for use with an ink jet printing apparatus, the ink being a liquid at about 100°C to about 130°C and solidifying to a two-phase solid having an elastic phase and a crystalline phase, the ink comprising:

stearic acid present in a concentration of about 45 percent to about 95 percent ✓✓
of the ink;

an aromatic hydrocarbon resin first plasticizer present in a concentration of ✓✓
about 0.1 percent to about 25 percent of the ink;

a tri-block copolymer present in a concentration of about 0.5 percent to about ✓✓
5.0 percent of the ink;

polyvinyl butyral in a concentration of about 0.5 percent to about 10 percent of ✓✓
the ink;

a fluorinated polyolefin copolymer present in a concentration of about 0.5 ✓✓
percent to about 10 percent of the ink; and

a colorant present in a concentration of about 2.0 percent to about 8.0 percent of the ink,

wherein the polyvinyl butyral, in combination with tri-block copolymer forms an elastic phase of the ink upon solidifying, and wherein the aromatic hydrocarbon resin exhibits sufficiently low viscosity at elevated temperatures to permit ejection of the liquid ink from the printing apparatus.

26. The hot-melt ink in accordance with claim 25 wherein the linear block copolymer is a tri-block copolymer.

27. The hot-melt ink in accordance with claim 26 wherein the tri-block copolymer is a styrene-butadiene-styrene block copolymer.

28. The hot-melt ink in accordance with claim 26 wherein the tri-block copolymer is a styrene-isoprene-styrene block copolymer.

29. The hot-melt ink in accordance with claim 26 wherein the colorant is Orient Oil black.

30. A method for producing indicia on a substrate comprising the steps of:
heating to liquid a non-aqueous, solid hot-melt ink formulation to a temperature of not more than 130°C;
ejecting the liquid from a printing device; and
allowing the liquid to solidify.

31. The method for producing indicia in accordance with claim 30 wherein the liquid is heated to a temperature of not more than 120°C.